Shared Vision Planning

Case Study Perspectives from Northwestern Division

Matthew Rea, Portland District, USACE
Jerry DelliPriscoli, Institute for Water Resources, USACE
www.SharedVisionPlanning.us

Institute for Water Resources

Brazilian

Presentation Overview

- What is Shared Vision Planning (SVP)?
- 3 Examples from Northwestern Division
  - A SVP in Regulatory example: Cache La Poudre River, CO
  - SVP for reservoir operations & Water Quality: Willamette River Basin, OR
  - SVP in Initial Stages of Project Planning: Columbia River Basin 2014 Treaty

Water management is characterized by…

- Persistent conflict
- Complexity & uncertainty in overlapping systems
  - Natural systems: hydrology, ecology etc.
  - Human systems: infrastructure, policy, funding, etc.
- Conflicting interests & values
- Interest groups and the public demanding involvement

To Survive in this Environment Requires:

Technical Tools

- Understand basic hydrology, ecology, economics, etc
- Accurately represent the linkages between these areas

Process Skills

- Understand institutional setting
- Develop ways to engage Stakeholders
- Build trust

integrates tried-and-true **planning principles, systems modeling and collaboration** into a practical forum for making resource management decisions;

*SVP means **involving stakeholders in the technical analysis** – in the data and technical relationships*

Brazilian

“the process of building a model is a way of working out a shared view of what is being managed and how the managing should be done." K. Lee

- SVP builds understanding of the system –
- SVP builds confidence in the analysis
- SVP builds trust between stakeholders

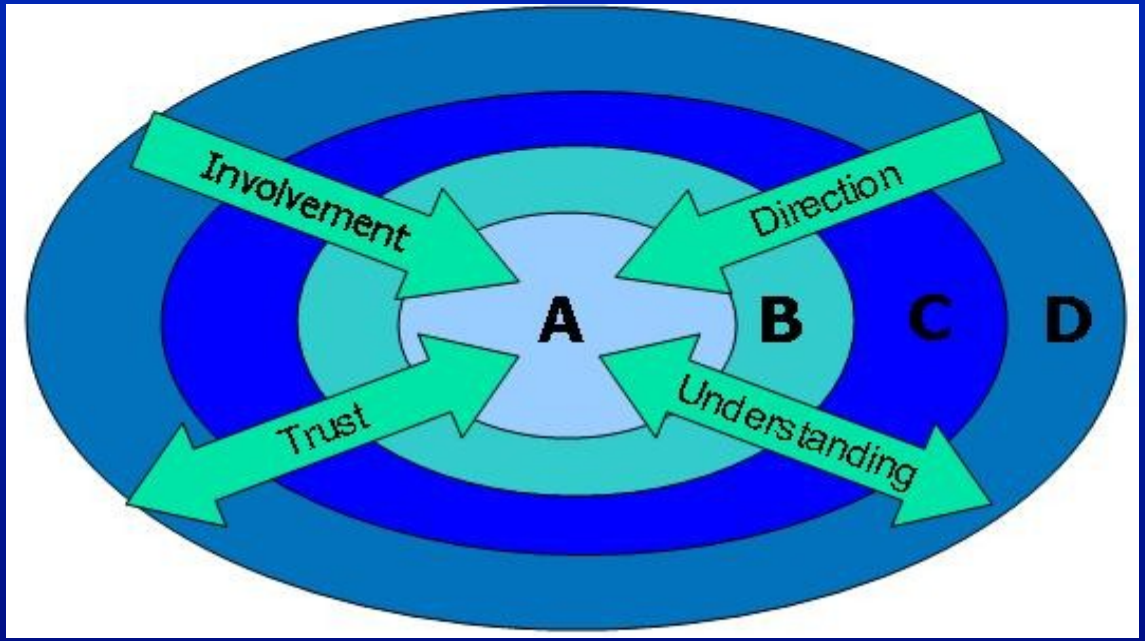
SVP modifies P&G Planning Steps

- Builds a *team* of stakeholders, decision makers, & experts to identify problems, & develop objectives/metrics
- Using collaboratively developed models, team iteratively formulates & evaluates of alternatives
- Develop team recommendations based on collaborative analysis
- Model serves as the backb
  collaborative process

Brazilian

SVP relies on Structured Collaboration

- "Circles of Influence" concept relies on team building.
- Concentric circles link representatives with differing levels of personal involvement



Circle A – Model Building team

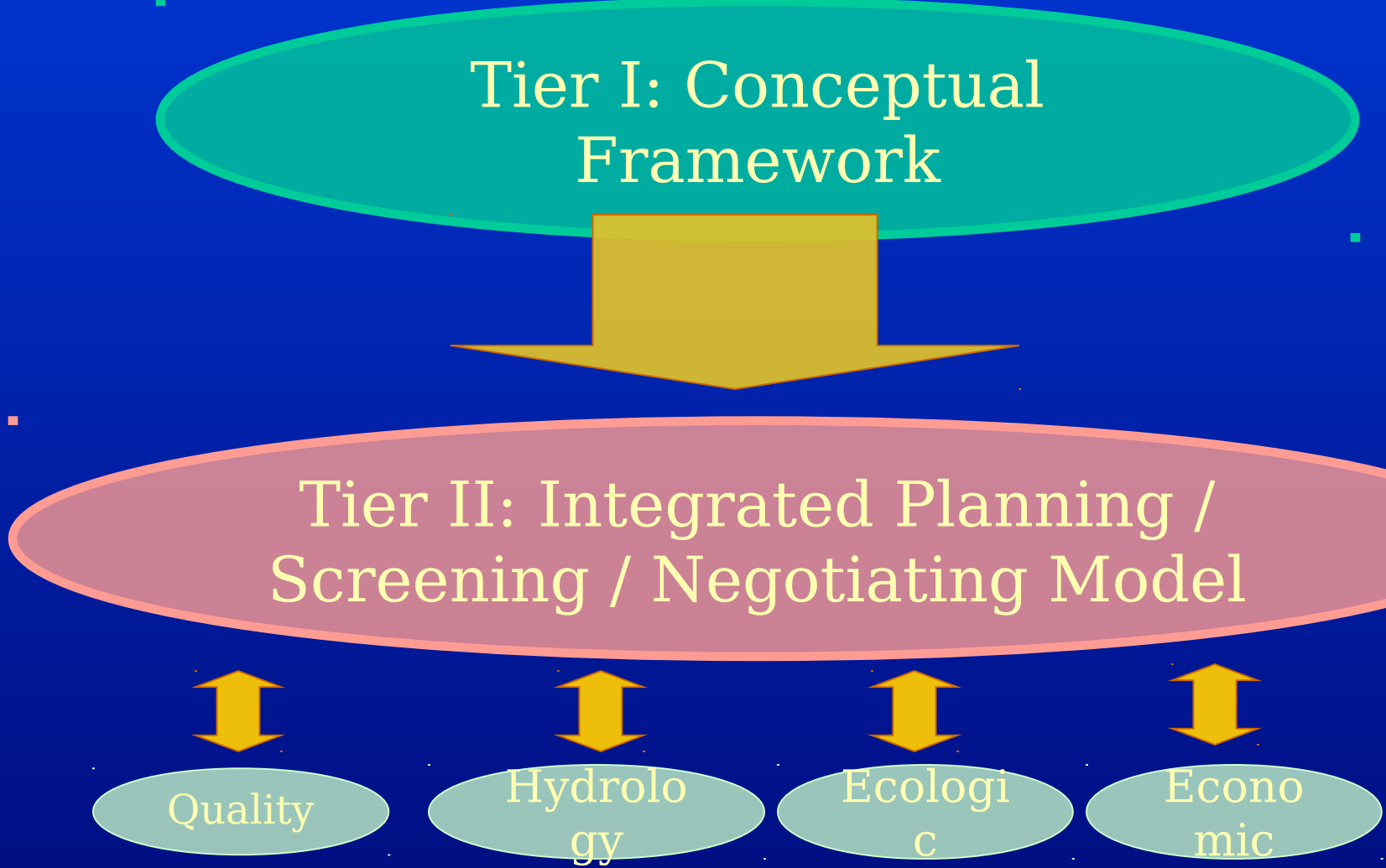
Circle B – Model Users, Validators

Circle C – All Interested Parties

Circle D – Decision Makers

What we want from technical analysis within SVP

- **Integrated**
  - stakeholder interests & interactions are in one place
- **User Friendly**
  - can be used by multiple stakeholders & decision makers
- **Understandable/Transparent**
  - assumptions, input, relationships, & output
- **Relevant**
  - to multiple interests & values
- **Adaptable/Flexible**
  - to changing conditions or evolving process


Tier I: Conceptual Framework
Tier II: Integrated Planning / Screening / Negotiating Model
Quality
Hydrology
Ecologic
Economic
Tier III: Detailed Data Sets and Numerical Models

What is different…

from other collaborative planning processes?

- the focus on the technical analysis.

from traditional technical analysis?

- the participation of stakeholders in developing and validating the analysis

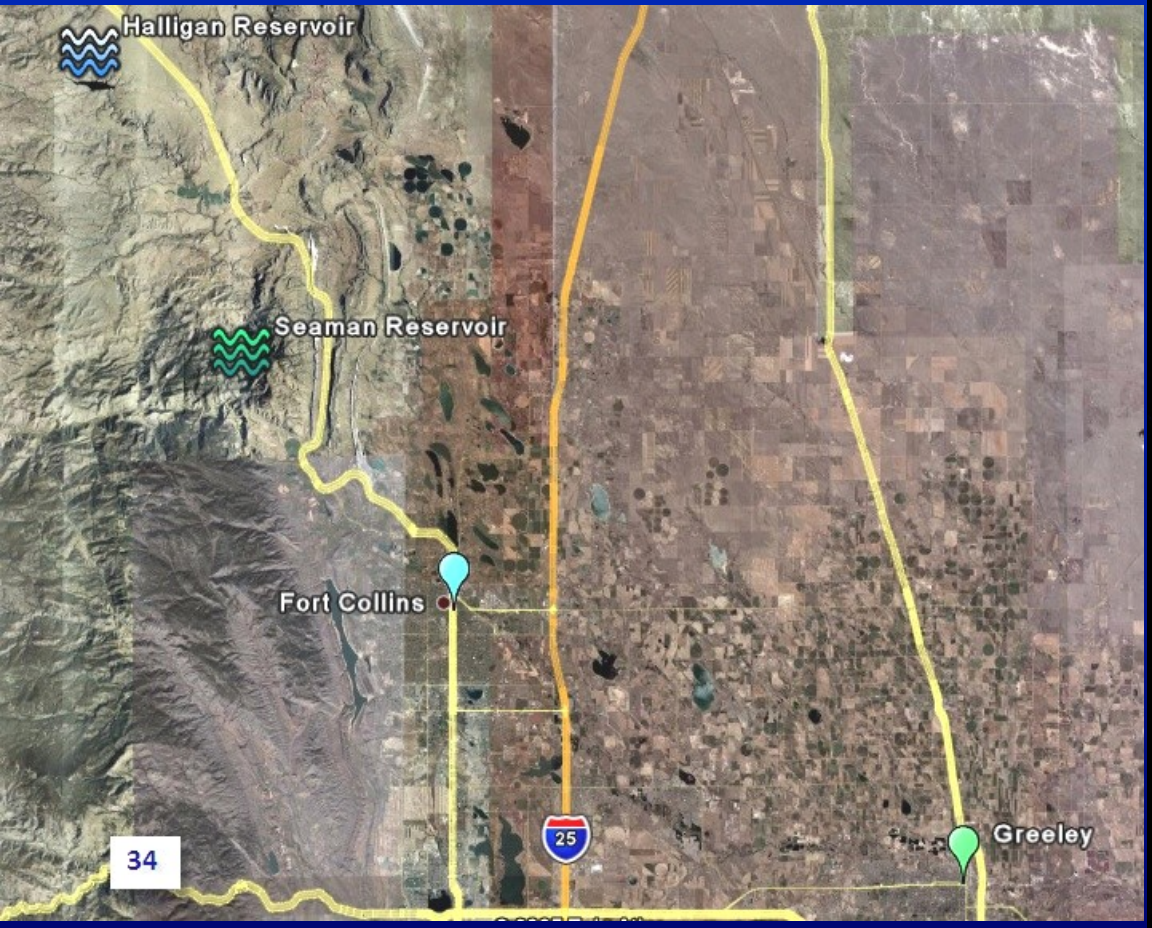
Example 1:
SVP application in Regulatory with Western States Water Council

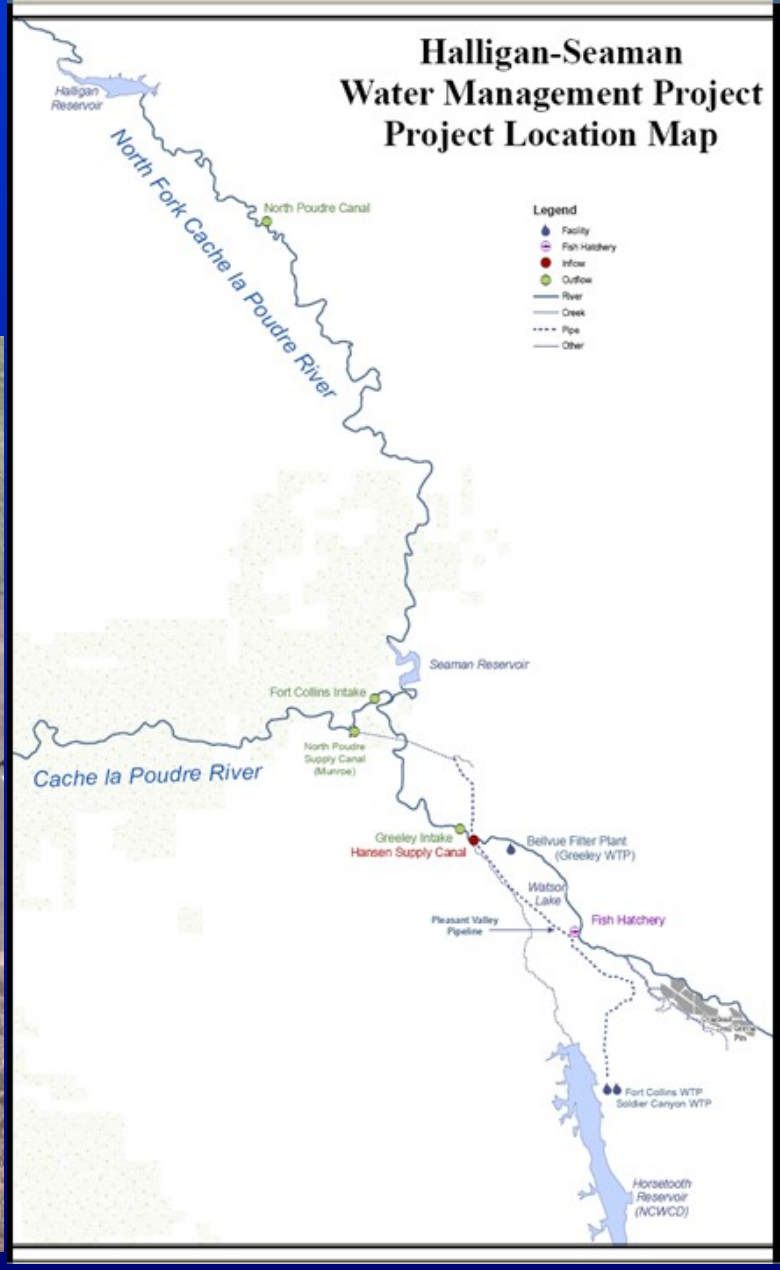
Cache La Poudre River, CO

Public Participation

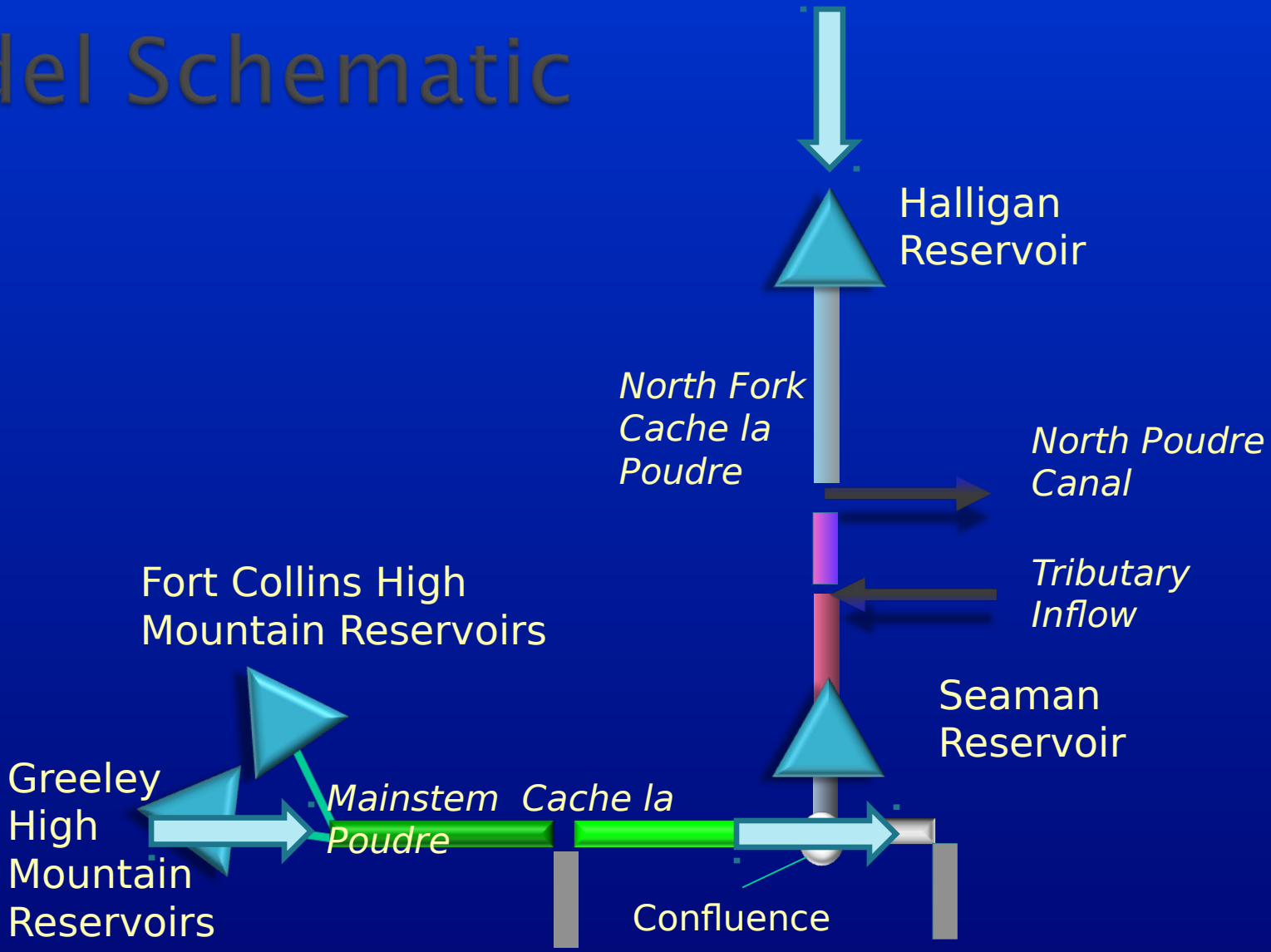
- Anyone who can “veto” should be involved
- Includes decision makers or NGOs who can access through public review but without shared vision
- Practical limits – not every possible individual, but involve the true leaders of different sectors

Cache La Poudre River, CO





Model Schematic



What Could Happen?

Better, Faster, Cheaper

- What could go right?
  - Open up the permit process so there is more immediate feedback about what would be permittable
  - Clarify the objectives and constraints of all who will have a voice in the permitting process.
  - One medium length analysis that leads to a decision versus countless short to medium length revisions brought on by challenges
  - Better solution
- What could go wrong?
  - Participants hoping for a specific alternative may not be able to stay with the process
  - Participants could fake collaboration (“Oh, I thought you said “discovery”)

Example 2:
An SVP application for Reservoir Operations and TMDLs

Willamette River, OR

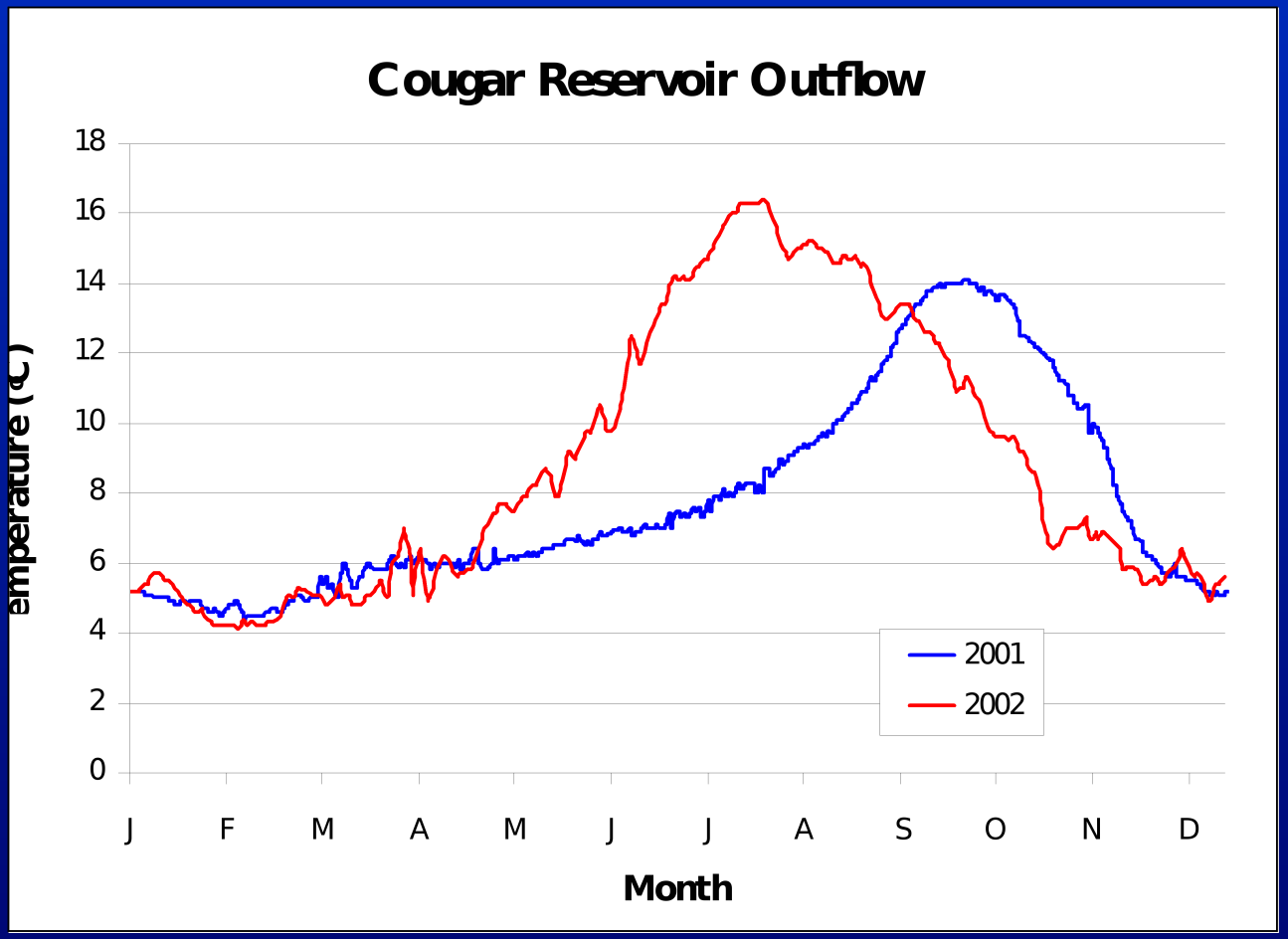
Willamette Basin, Oregon

- 28750 km^2
- 300 km long
- 68% of Oregon's Population (5 mil)
- Flow at mouth:
  - 225 to 2000 m^3/s
  - 13th largest in the US
  - Most runoff per unit land area of any of the 12 larger rivers
- 15 major dams

Motivational Drivers

- **2007 – Oregon Dept. of Environmental Quality adopts a TMDL for Temperature for Willamette River and Tributaries**
- **2008 – USFWS and NMFS draft Biological Opinions for continued O&M of Corps Willamette Valley Projects**
- **Longstanding concerns regarding effects of reservoir operations on Recreation and other project purposes**
- **Pending near-term M&I and Irrigation water supply reallocation and contracting issues**
- **Interest in establishing a marketplace for ecological goods and services associated with Ecosystem Restoration**

The Importance of Temperature Regimes



Willamette: Key Players

- *USACE - Portland District:* Operates 13 reservoirs in the basin for flood control, power generation, recreation, and water quality

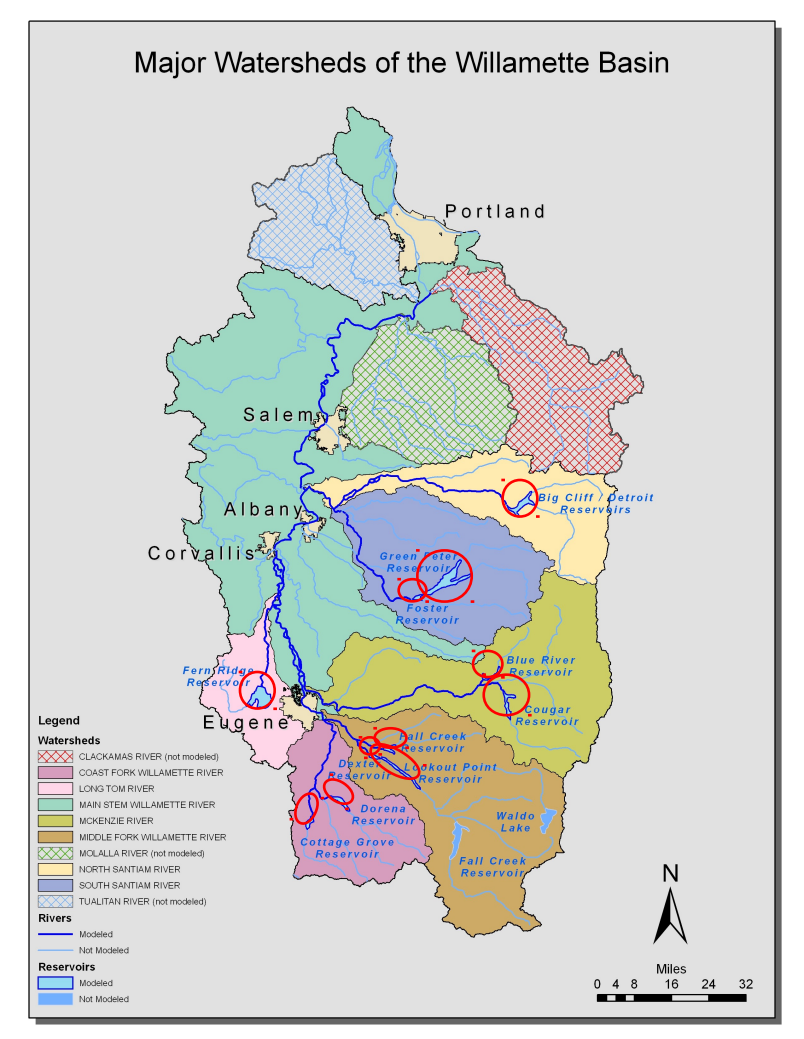
- *Willamette Partnership*: Consortium of interested parties including ODEQ, industry, local, regional, and state governments, NGO's, and academia
  - Evaluate policy alternatives for temperature trades in the basin
  - $ value to point source reductions, added shading, etc.

- *Local stakeholders*: Build confidence and support for any decisions that are made

Model Objectives

- Cause
  - Reservoir operations
    - Priority
    - Spill
    - Storage
  - Shading
    - Public open lands
    - Private land
  - Point Source
    - Cooling strategies
    - Heat trading
- Effect
  - Flow rates
  - Temperature
  - Costs
  - Fish habitat
  - Power generation
  - Recreation
    - Day and overnight
    - Fishing, boating, picnicking, camping
    - Economic impact
  - Nutrient loading
  - Carbon sequestration

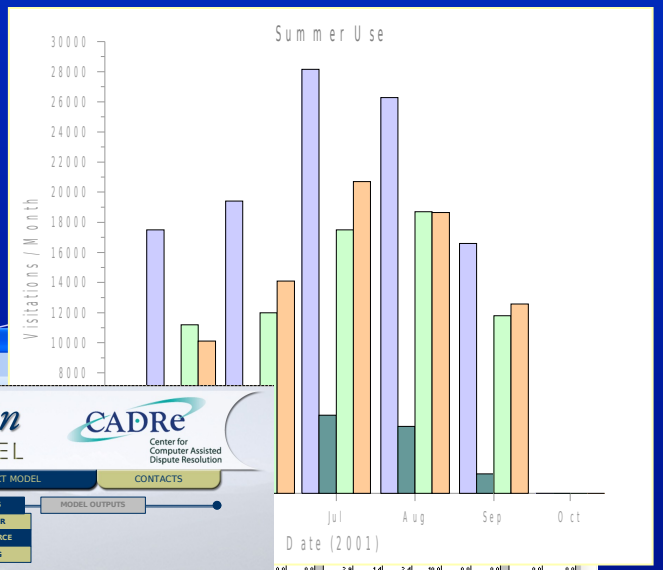
Model Domain

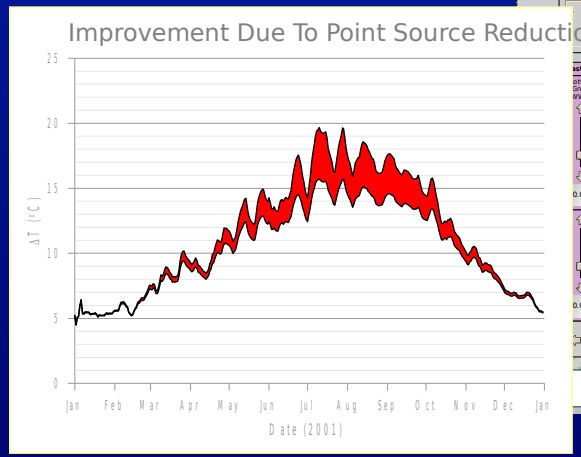


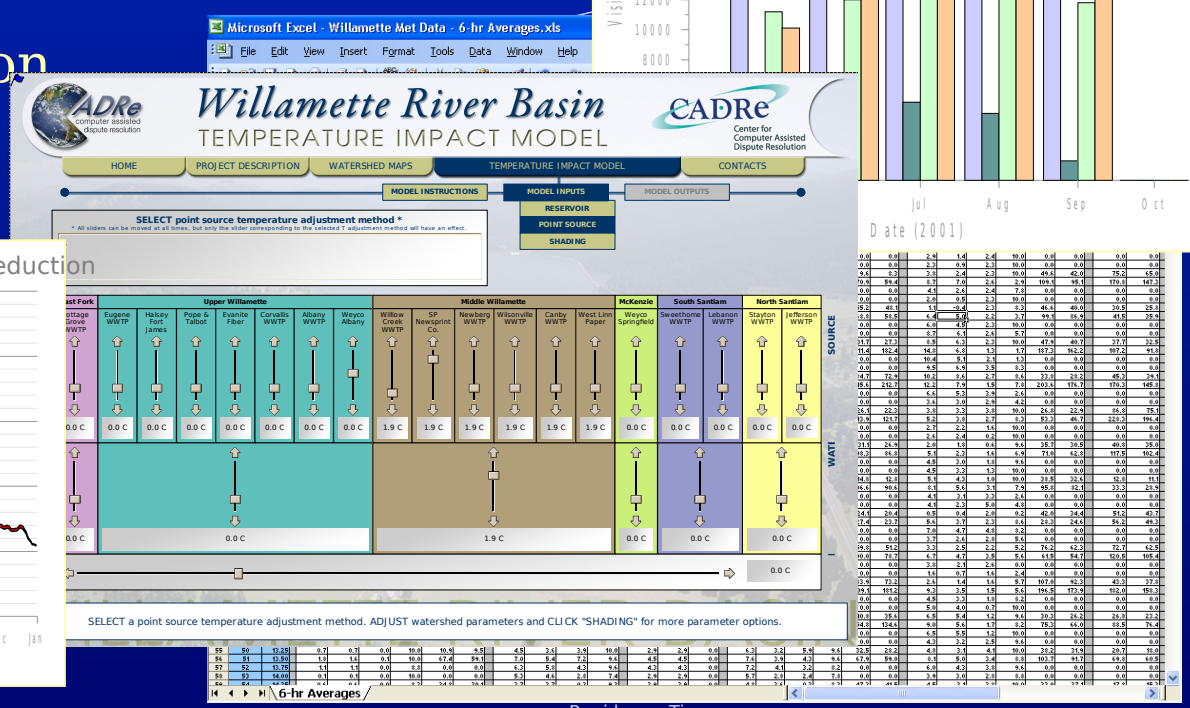
- 7 Watersheds
  - Willamette
    - Coast Fork
    - Middle Fork
    - Main stem
  - Santiam
    - North
    - South
  - McKenzie
  - Long Tom
- 11 Reservoirs
- Simulation year: 2001

Modeling Approach

- System Dynamics - Powersim
  - Stocks and Flows
  - Link w/ Outside Data
  - Visualization
  - Quick execution
  - Optimization

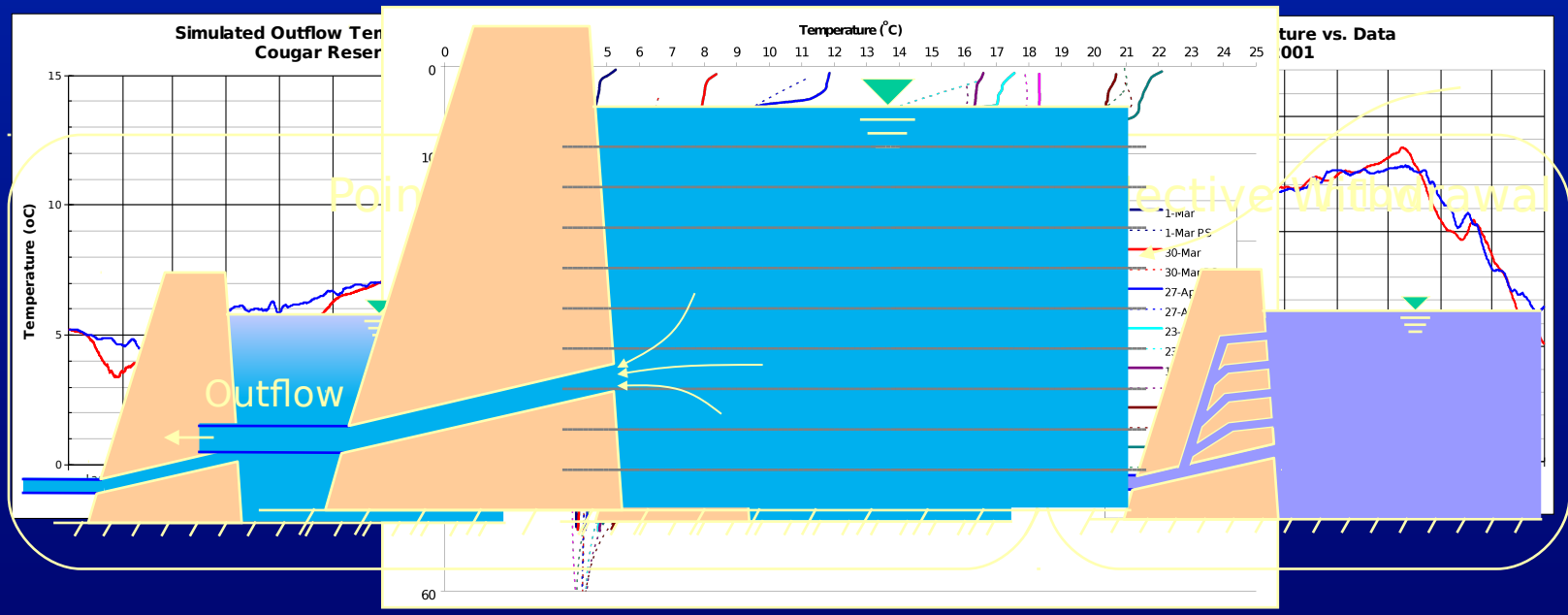






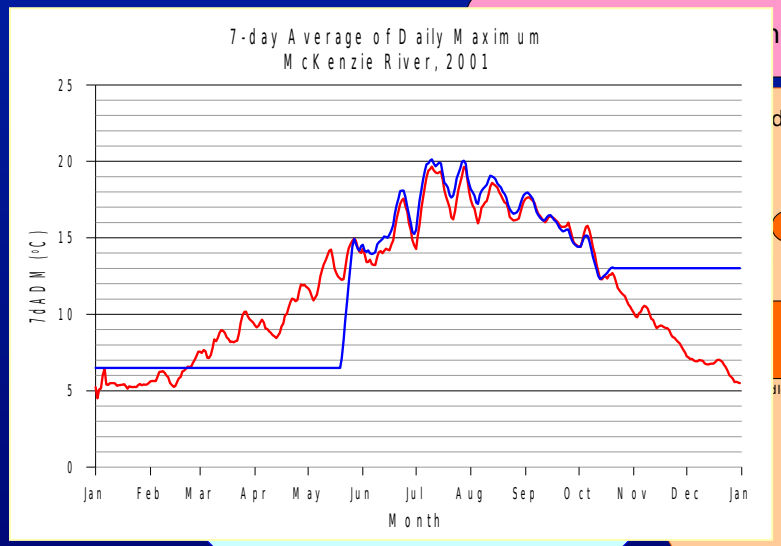
Reservoir Modeling

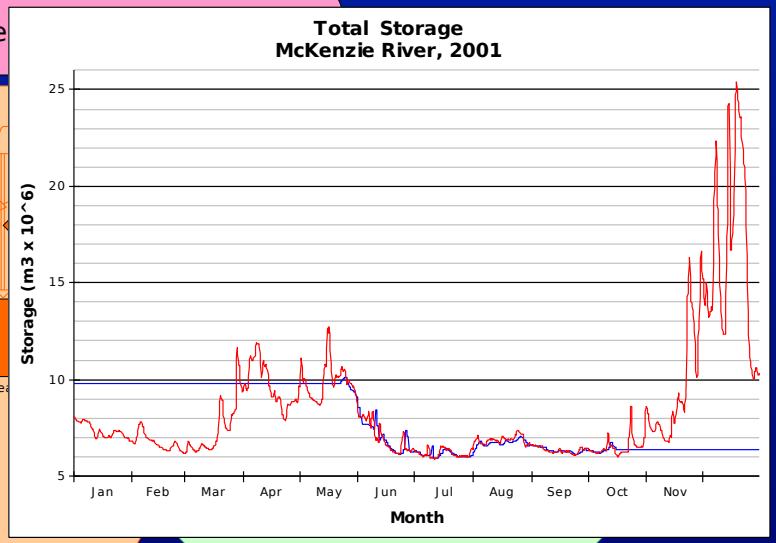
- Model
  - 1-d vertical
  - Inflows and outflows from data
  - Stratification
  - Selective withdrawal
- Calibration
  - Outflow temperature
  - Vertical temperature profiles



River Modeling

- Model
  - Lumped Parameter
    - 1 to 3 stream reaches
  - Inflows and outflows from data
  - Reservoirs form upper boundary
- Calibration
  - Stream storage
  - CE-Qual-W2 7dADM





Graphical User Interface

ADRe
computer assisted dispute resolution
Willamette River Basin
TEMPERATURE IMPACT MODEL
CADRe
Center for Computer Assisted Dispute Resolution
HOME
PROJECT DESCRIPTION
WATERSHED MAPS
TEMPERATURE IMPACT MODEL
CONTACTS
This model is intended to simulate the effects and impacts on temperature of different management, restoration, and operation scenarios on and within the Willamette Basin.
Key Model Inputs
1. Reservoir Operations
2. Shading Restoration
3. Outfall Modifications
4. Demographics
5. Conservation Measures
6. Economic Costs
Key Model Outputs
1. 7-day Moving Average
2. Source Heat Loading
3. Costs per kcal
4. Areas of Greatest Impact
5. Other Ecosystem Benefits
developed in collaboration by
Sandia National Laboratories
US Army Corps of Engineers
David Evans and Associates
The Willamette Partnership
Text in this area will prompt users how to proceed through this application. CLICK on any of the GOLD buttons to proceed.
To RUN the model CLICK on the GOLD "TEMPERATURE IMPACT MODEL" button on top navigation bar.
WILLAMETTE RIVER BASIN

Example 3:
A Potential Future SVP Project

Columbia River Basin 2014 Treaty

The Columbia River Basin

Significant Investment in Water Resources

- **Columbia Basin: 671,000 square miles (about the size of the Province of Alberta or the State of Texas.**
- **Sixth largest river basin North America**
- **Crosses international boundary and seven state boundaries.**
- **Diverse ecosystems from interior rain forests to grasslands, to deserts.**
- **Over 700 species of fauna.**

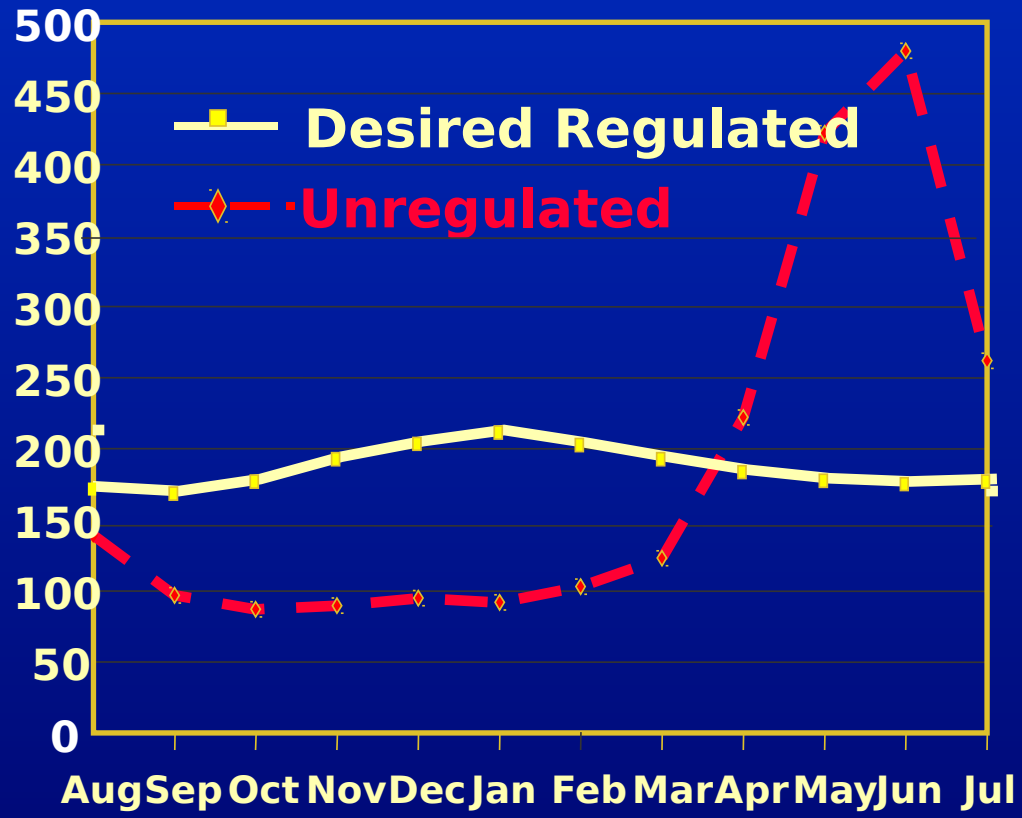
Large Seasonal Flow Variation

1/3 of the Columbia River water comes from Canada.

Canada has 15% of the basin area, but 30% of 134 million acre feet (MAF) average annual flow at The Dalles.

50% of worst Columbia flood flows at The Dalles came from Canada.

Flow at border varies from 14,000 to 555,000 cubic feet per second (cfs), much wider variation than Mississippi or St. Lawrence



Treaty Background

US/Canada Treaty – Why?

USA had hydropower and flood control needs.

Canada had excellent dam sites.

Treaty ratified in 1964

Required Canada to construct Mica, Arrow, & Duncan Reservoirs. Operate them for flood control and power generation.

Required US to pay Canada 50% of estimated value of the future flood control benefits in the US & deliver 50% of the increased power capability. US paid in lump sum.

Permitted US to construct Libby. Allows for Canada to divert water from Kootenay River (this hasn't happened)

Photo by J. Hyde

Treaty Background

Either government has option to terminate in 2024

- **Must give a 10 year advance notice –**
- **thus 2014 is date that is used for notification.**

If Terminated:

- **Mica, Arrow, Duncan, Libby may continue to operate.**
- **Canada may provide some amount of flood control**
- **Compensation will be required.**

Why SVP Could be an Important Tool

- Treaty will be “revisited”. State Department will negotiate treaty with Canada. Canada will desire compensation for hydropower, flood control, and other benefits.
- Current treaty has little direct treatment of fish protection, water supply, navigation, and other environmental concerns.
- Other stakeholders in the Columbia basin will want to be involved in the process
- Outputs/impacts will have to be evaluated.
- Accurate, up-to-date, information will be necessary to enter into negotiations. Corps will play a lead role in developing information.

Wrap Up

- Today's water problems demand technical and process tools
- *Shared Vision Planning* integrates tried-and-true planning principles, systems modeling and collaboration
- Collaborative model-building has been applied in varying intensities and in many contexts
- Interagency Federal Research initiative
- Rather than a battle over a fixed p
  encourages people to fi
  (or at least be

Shared Vision Planning

Institute for Water Resources

Brazilian

Welcome to Shared Vision Planning - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://www.svp.iwr.usace.army.mil/index.cfm Go

CONTACTS | SEARCH | SITE MAP | FAQS | ABOUT THE PROGR

Shared Vision Planning

- PLANNING PRINCIPLES
- SYSTEMS MODELING
- COLLABORATION

- News and Events
- Current Intiatives
- Tools and Techniques
  - Methods
  - Models
- Resources
  - Case Studies
  - References
- Training
- CADRe Partners

About Shared Vision Planning

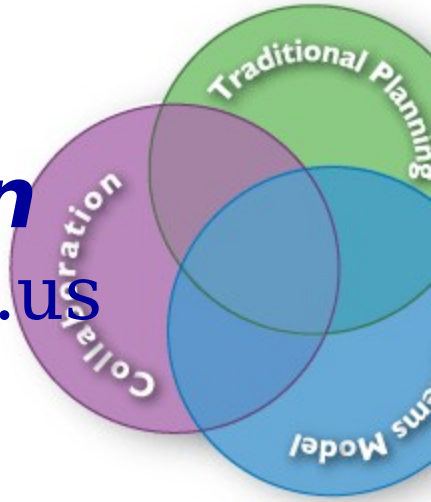
Shared Vision Planning (SVP) is a collaborative approach to formulating water management solutions that combines three disparate practices: 1) traditional water resources planning, 2) structured public participation and 3) collaborative computer modeling. Although each of these elements has been successfully applied, what makes Shared Vision Planning unique is the integration of traditional planning processes with structured public participation and collaborative computer modeling.

For More Information

www.SharedVisionPlanning.us

Goal

The goal of Shared Vision Planning is to improve the economic, environmental and social outcomes of water management decisions. Shared Vision Planning facilitates a common understanding of a natural resource system and provides a consensus-based forum for stakeholders to identify tradeoffs and new management options. Shared Vision Planning creates user-friendly and understandable computer models that are relevant to stakeholder interests and adaptable to changing conditions.



Shared Vision Planning integrates

- tried-and-true Planning princ

What's in this Web Site